

Environmental Product Declaration

according to ISO 14025 and EN 15804



This declaration is for:

**MOVE, machine room-less elevator
(1050 kg)**

Provided by:

Mitsubishi Elevator Europe B.V.



program operator

Stichting MRPI®

publisher

Stichting MRPI®

www.mrpi.nl

MRPI® registration

1.1.00455.2023

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COMPANY INFORMATION



MITSUBISHI ELEVATOR EUROPE

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PRODUCT

MOVE, machine room-less elevator (1050 kg)

DECLARED UNIT/FUNCTIONAL UNIT

1 tkm

DESCRIPTION OF PRODUCT

The electric MOVE elevator without machine room has a rated load of 1050 kg, with transport of passengers in low- to mid-rise buildings as main application.

VISUAL PRODUCT



MORE INFORMATION

<https://www.mitsubishi-elevators.com/move/>

MRPI® REGISTRATION

1.1.00455.2023

DATE OF ISSUE

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SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Gert-Jan Vroege**, **Eco Intelligence**.

The LCA study has been done by **Freya Goffart De Roeck**, **Ecomatters B.V.**

The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A2. It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2. Declaration of SVHC that are listed on the 'Candidate List of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

Stichting MRPI®
Kingsfordweg 151
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ir. J-P den Hollander, Managing director MRPI®

DEMONSTRATION OF VERIFICATION

CEN standard EN15804 serves as the core PCR[a]

Independent verification of the declaration and data,
according to EN ISO 14025:2010:
internal: external: X

Third party verifier:

Gert-Jan Vroege, Eco Intelligence

[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

Production process:

On the Mitsubishi manufacturing site, the steel, plastic, wood and electronic components are assembled into an elevator. The manufacturing process includes welding, laser cutting and press brakes. Afterwards, packaging is added for transport to the installation site.

Condition of delivery:

The elevator is pre-assembled as far as possible and ready for installation. All additional materials necessary for operating, such as cabling, full steel guide rails and landing doors are included.

Product components:

Steel, aluminium, plastics, wood, electronics, motor

Reference service life:

25 years

Description and application	Value
Commercial name	MOVE
Type of installation	New generic machine room-less elevator
Main purpose	Transport of passengers
Type of lift	Electric
Type of drive system	Gearless traction
Geographic region of intended installation	The Netherlands
Recommended application	Low- to mid-rise buildings, such as residential buildings, hotels, hospitals, shopping and museums

Characteristics	Value
Rate load	Range of 0 - 1050 kg, with representative value of 1050 kg
Rate speed	Range of 1,0 or 1,6 m/s, with representative value of 1,0 m/s
Number of stops	Range of 2 - 24 stops, with representative value of 5 stops
Travelled height	Range of 0 - 70 m, with representative value of 15 m
Number of operating days per year	Range of 260 - 360 days, with representative value of 360 days
Applied usage category (UC) according to ISO 25745-2	3
Reference power	12,3 kW

Dimensions and weight	Value
Weight of product	4746,2 kg
Weight of packaging	184,9 kg
Dimensions of product and packaging	2,81 m * 1,76 m * 19,8 m

COMPONENT > 1% of total mass	[kg]
Ferrous metals	4432.9
Non-ferrous metals	62
Plastics and rubbers	37.3
Inorganic materials (e.g. Concrete)	17.5
Organic materials (e.g. Paper and wood)	231.16
Electric and electronic equipment	142.6
Batteries and accumulators	4.8
Other materials	6.8
TOTAL	4934.9

SCOPE AND TYPE

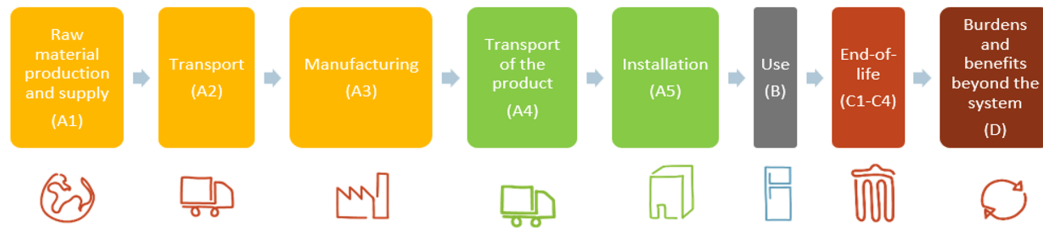
This LCA is Cradle to Grave. All major steps from the extraction of natural resources to the final disposal of the product are included in the scope of the study. This EPD is for a generic elevator of the MOVE series, with representative load rate of 1050 kg. The elevator is produced by Mitsubishi Elevator Europe B.V. in Veenendaal (The Netherlands), and the fate of the elevator at the end-of-life is described within the Dutch context.

The software LCA for Experts (GaBi) 10.7.0.183 is used to perform the LCA. Background processes are sourced from Ecoinvent 3.9.1 (2022).

PRODUCT STAGE			CONSTRUCTION					USE STAGE							END OF LIFE				BENEFITS AND	
			PROCESS												STAGE				LOADS BEYOND THE	
			STAGE																SYSTEM BOUNDARIES	
Raw material supply																				
	Transport																			
		Manufacturing																		
			Transport gate to site																	
				Assembly																
					Use															
						Maintenance														
							Repair													
								Replacement												
									Refurbishment											
										Operational energy use										
											Operational water use									
												De-construction demolition								
													Transport							
														Waste processing						
															Disposal					
																	Reuse-Recovery-Recycling-potential			
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D				
X	X	X	X	X	ND	X	ND	ND	X	X	ND	X	X	X	X	X				

X = Modules Assessed

ND = Not Declared



LCA process diagram according to EN 15804 (7.2.1)

REPRESENTATIVENESS

The EPD representative for the MOVE elevator with a representative rate load of 1050 kg, and an applied usage category 3, which is manufactured and installed in The Netherlands by Mitsubishi Elevator Europe B.V., located in Veenendaal.

ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B2	B5	B6	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	1.90 E+1	7.05 E-1	1.53 E-2	1.97 E+1	8.54 E-2	-1.66 E-1	0.00	4.63 E+0	2.07 E+1	0.00	9.99 E-2	1.34 E-1	4.95 E-1	-4.84 E+0
GWP-fossil	kg CO2 eq.	1.90 E+1	7.04 E-1	1.00 E-1	1.98 E+1	8.53 E-2	1.66 E-1	0.00	4.60 E+0	2.05 E+1	0.00	9.97 E-2	1.35 E-1	2.78 E-1	-4.99 E+0
GWP-biogenic	kg CO2 eq.	-6.89 E-2	6.85 E-4	-8.48 E-2	-1.53 E-1	8.34 E-5	-3.34 E-1	0.00	2.63 E-2	2.45 E-1	0.00	9.76 E-5	-1.72 E-3	2.16 E-1	1.37 E-1
GWP-luluc	kg CO2 eq.	2.75 E-2	3.76 E-4	1.64 E-4	2.80 E-2	4.10 E-5	7.32 E-4	0.00	8.63 E-3	6.80 E-3	0.00	4.79 E-5	1.88 E-4	6.35 E-5	8.25 E-3
ODP	kg CFC11 eq.	4.70 E-7	1.49 E-8	1.81 E-9	4.86 E-7	1.81 E-9	4.21 E-9	0.00	2.38 E-7	6.08 E-7	0.00	2.11 E-9	2.03 E-9	1.62 E-9	-1.02 E-7
AP	mol H+ eq.	1.52 E-1	2.16 E-3	6.96 E-4	1.55 E-1	2.71 E-4	1.14 E-3	0.00	4.18 E-2	3.36 E-2	0.00	3.17 E-4	1.35 E-3	2.18 E-4	-1.68 E-2
EP-freshwater	kg PO4 eq.	1.53 E-2	5.36 E-5	1.05 E-5	1.54 E-2	5.81 E-6	7.31 E-5	0.00	6.60 E-3	6.80 E-3	0.00	6.80 E-6	7.16 E-5	1.46 E-5	-1.91 E-3
EP-marine	kg N eq.	2.22 E-2	7.20 E-4	3.32 E-4	2.32 E-2	9.34 E-5	4.35 E-4	0.00	6.87 E-3	1.06 E-2	0.00	1.09 E-4	3.14 E-4	8.58 E-5	-4.06 E-3
EP-terrestrial	mol N eq.	2.34 E-1	7.57 E-3	3.24 E-3	2.45 E-1	9.84 E-4	4.50 E-3	0.00	7.26 E-2	1.07 E-1	0.00	1.15 E-3	3.48 E-3	6.27 E-4	-4.47 E-2
POCP	kg NMVOC eq.	9.17 E-2	3.17 E-3	1.03 E-3	9.59 E-2	4.05 E-4	1.42 E-3	0.00	2.11 E-2	3.23 E-2	0.00	4.73 E-4	1.05 E-3	1.82 E-4	-2.63 E-2
ADP-minerals & metals	kg Sb eq.	2.04 E-3	2.64 E-6	1.99 E-7	2.04 E-3	2.67 E-7	6.89 E-7	0.00	1.73 E-3	1.09 E-5	0.00	3.12 E-7	7.40 E-6	1.21 E-7	6.15 E-5
ADP-fossil	MJ, net calorific value	2.66 E+2	9.78 E+0	1.35 E+0	2.77 E+2	1.19 E+0	3.23 E+0	0.00	6.95 E+1	3.35 E+2	0.00	1.39 E+0	1.81 E+0	5.44 E-1	-6.70 E+1
WDP	m3 world eq. deprived	8.46 E+0	6.40 E-2	1.16 E-2	8.54 E+0	7.21 E-3	2.09 E-1	0.00	1.64 E+0	6.02 E+0	0.00	8.43 E-3	3.62 E-2	1.35 E-1	1.07 E+0

GWP-total = Global Warming Potential total

GWP-fossil = Global Warming Potential fossil fuels

GWP-biogenic = Global Warming Potential biogenic

GWP-luluc = Global Warming Potential land use and land use change

ODP = Depletion potential of the stratospheric ozone layer

AP = Acidification Potential, Accumulated Exceedence

EP-freshwater = Eutrophication Potential, fraction of nutrients reaching freshwater end compartment

EP-marine = Eutrophication Potential, fraction of nutrients reaching marine end compartment

EP-terrestrial = Eutrophication Potential, Accumulated Exceedence

POCP = Formation potential of tropospheric ozone photochemical oxidants

ADP-minerals&metals = Abiotic Depletion Potential for non fossil resources [2]

ADP-fossil = Abiotic Depletion for fossil resources potential [2]

WDP = Water (user) deprivation potential, deprivation-weighted water consumption [2]

Disclaimer [2]

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B2	B5	B6	C1	C2	C3	C4	D
PM	Disease incidence	1.32 E-6	3.79 E-8	1.88 E-8	1.37 E-6	5.35 E-9	2.65 E-8	0.00	2.71 E-7	1.42 E-7	0.00	6.26 E-9	1.77 E-8	1.81 E-9	-3.42 E-7
IRP	kBq U235 eq.	1.34 E+0	1.65 E-2	2.97 E-3	1.36 E+0	1.58 E-3	3.73 E-2	0.00	4.99 E-1	2.36 E+0	0.00	1.84 E-3	1.34 E-2	3.78 E-3	7.41 E-2
ETP-fw	CTUe	1.36 E+3	9.95 E+0	1.46 E+0	1.37 E+3	1.19 E+0	5.87 E+0	0.00	6.10 E+2	1.99 E+2	0.00	1.39 E+0	6.90 E+0	6.15 E+0	-1.28 E+2
HTP-c	CTUh	1.75 E-7	3.51 E-10	7.34 E-11	1.76 E-7	3.97 E-11	1.08 E-9	0.00	9.16 E-9	4.39 E-9	0.00	4.65 E-11	2.06 E-10	4.12 E-11	-3.76 E-8
HTP-nc	CTUh	1.38 E-6	8.38 E-9	1.06 E-9	1.39 E-6	1.00 E-9	3.18 E-9	0.00	3.73 E-7	1.09 E-7	0.00	1.17 E-9	8.91 E-9	2.57 E-9	-8.60 E-8
SQP	---	1.15 E+2	4.79 E+0	1.14 E+1	1.31 E+2	7.01 E-1	4.36 E+1	0.00	2.36 E+1	6.08 E+1	0.00	8.20 E-1	2.90 E+0	1.48 E-1	-5.73 E+0

PM = Potential incidence of disease due to PM emissions

IRP = Potential Human exposure efficiency relative to U235 [1]

ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]

HTP-c = Potential Comparative Toxic Unit for humans [2]

HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]

SQP = Potential soil quality index [2]

Disclaimer [1]

- This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer [2]

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B2	B5	B6	C1	C2	C3	C4	D
PERE	MJ	3.20 E+1	1.84 E-1	2.42 E+0	3.46 E+1	1.83 E-2	8.66 E+0	0.00	6.53 E+0	3.83 E+1	0.00	2.14 E-2	2.55 E-1	4.82 E-2	7.26 E-1
PERM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	3.20 E+1	1.84 E-1	2.42 E+0	3.46 E+1	1.83 E-2	8.66 E+0	0.00	6.53 E+0	3.83 E+1	0.00	2.14 E-2	2.55 E-1	4.82 E-2	7.26 E-1
PENRE	MJ	2.66 E+2	9.78 E+0	1.35 E+0	2.77 E+2	1.19 E+0	3.23 E+0	0.00	6.95 E+1	3.35 E+2	0.00	1.39 E+0	1.82 E+0	5.44 E-1	-6.70 E+1
PENRM	MJ	8.76 E-3	3.04 E-4	1.76 E-4	9.24 E-3	3.46 E-5	6.62 E-4	0.00	1.74 E-3	2.00 E-3	0.00	4.04 E-5	4.05 E-4	4.50 E-5	-1.64 E-3
PENRT	MJ	2.66 E+2	9.78 E+0	1.35 E+0	2.77 E+2	1.19 E+0	3.23 E+0	0.00	6.95 E+1	3.35 E+2	0.00	1.39 E+0	1.82 E+0	5.44 E-1	-6.70 E+1
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	1.97 E-1	1.49 E-3	2.70 E-4	1.99 E-1	1.68 E-4	4.87 E-3	0.00	3.82 E-2	1.40 E-1	0.00	1.96 E-4	8.42 E-4	3.13 E-3	2.48 E-2

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy resources excluding non-renewable energy resources used as raw materials

PENRM = Use of non-renewable primary energy resources used as raw materials

PENRT = Total use of non-renewable primary energy resources

SM = Use of secondary materials

RSF = Use of renewable secondary fuels

NRSF = Use of non renewable secondary fuels

FW = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B2	B5	B6	C1	C2	C3	C4	D
HWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	5.06 E-2	5.06 E-2	0.00	5.19 E-2	0.00	0.00	0.00	0.00	0.00	0.00	3.02 E-1	0.00
RWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	0.00	0.00	2.19 E-1	0.00	0.00	0.00	0.00	0.00	5.15 E-1	0.00	0.00
MFR	kg	0.00	0.00	9.52 E-1	9.52 E-1	0.00	2.48 E-1	0.00	0.00	0.00	0.00	0.00	4.49 E+0	0.00	0.00
MER	kg	0.00	0.00	1.00 E-3	1.00 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.15 E-2	0.00	0.00
EEE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

HWD = Hazardous Waste Disposed

RWD = Radioactive Waste Disposed

MFR = Materials for recycling

EEE = Exported Electrical Energy

NHWD = Non Hazardous Waste Disposed

CRU = Components for reuse

MER = Materials for energy recovery

ETE = Exported Thermal Energy

BIOGENIC CARBON CONTENT per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B2	B5	B6	C1	C2	C3	C4	D
BCCpr	kg C	1.54 E-2	0.00	0.00	1.54 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BCCpa	kg C	0.00	0.00	9.81 E-2	9.81 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BCCpr = Biogenic carbon content in product

BCCpa = Biogenic carbon content in packaging

CALCULATION RULES

Data quality and data collection period:

Data quality requirements follow EN15804+A2:2019. Used datasets are complete according to the system boundary, and are as current as possible. Foreground data is of reference period 2023, representing 1-year averaged data. Processes used in the background modelling are referring to Ecoinvent 3.9.1, the most recent version of the widely used database and are consistent with the foreground modelling in system limits and allocation procedures. The technological and geographical coverage reflects the physical reality as far as possible taking into account the technology mix, location, and representativeness of technologies, input materials, and input energies for the region. Data quality is assessed as good on average and adequate to the goal and scope of the study.

Cut-off criteria and allocation procedures:

No cut-offs or allocation procedures were intentionally applied to inputs and outputs within the system boundaries in the models. Cut-off and allocation procedures in the background processes are according to the respective methodologies and estimated to be methodologically consistent with the foreground system.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

The product stage is reported in life cycle stages A1-A3. This life cycle stage includes the extraction and processing of raw materials for the product and the packaging, their transportation to the production site by road and air, and the manufacturing process. The manufacturing stage (A3) includes all processes related to assembling the elevator, including energy consumption and waste treatment, for which specific data per elevator is available. Electricity consumption is modelled using primary data on the amount and a dataset for Dutch wind energy of the Ecoinvent 3.9.1 database.

The installation stage (A4-A5) includes transport of the elevator to the installation site, and the materials and energy required to install the elevator into the building, also including treatment of waste from installation materials and packaging.

The use stage includes refurbishment of the elevator by replacement of some components during the lifetime, and the power consumption of the elevator over the reference lifetime of 25 years. The power consumption is calculated using the methodology of ISO 25745-2 and medium voltage electricity from the Dutch market is assumed.

For the end-of-life stage (C), a scenario is used which is based on Ecoinvent 3.9.1 datasets and default values.

To calculate the benefits and loads beyond the system boundaries (module D), Formula D.6. from EN1504+A2 was used.

Transport of waste to treatment (C2)	Distance
Distance from deconstruction site to scrap processing plant, if waste materials are reused and recycled	100 km
Distance from deconstruction site to scrap processing plant, if waste materials are incinerated or landfilled	200 km

Waste treatment scenario (A5, C3, C4)	Reuse	Recycling	Incineration with energy recovery	Incineration without energy recovery	Landfill
Steel	11%	89%	0%	0%	0%
Aluminium	0%	96%	0%	0%	4%
Wood (product)	0%	40%	58%	0%	2%
Non-hazardous waste	0%	65%	8%	1%	26%
Wood (packaging)	0%	68%	26%	6%	0%
Plastic (packaging)	0%	49%	46%	5%	0%
Cardboard (packaging)	0%	89%	10%	1%	0%

DECLARATION OF SVHC

As part of their ongoing compliance commitments, Mitsubishi aims to identify which, if any, substances of very high concern (SVHCs), are contained within the product they supply to their customers and in what concentrations.

Currently Mitsubishi is not aware of any SVHC present in the elevators or their subcomponents, which fall under the scope of this LCA, exceeding the weight threshold of 0.1% as laid down in Article 33 of the EU REACH regulation

REFERENCES

- EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations
- Core rules for the product category of construction products
- Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., and Weidema, B. (2016). The ecoinvent database version 3 (part I): overview and methodology. The International Journal of Life Cycle Assessment, [online] 21(9), pp.1218–1230. Available at: <<http://link.springer.com/10.1007/s11367-016-1087-8>> [Accessed 14 02 2020].
- ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines

REMARKS

None